DOCUMENT RESUME

ED 453 054 SE 064 394

AUTHOR	Depeyre, Dominique; Grimm, Daniel
TITLE	An Example of Strategy for International Partnership in Engineering Education through Two Different Double Degree Programs: Ten Years of Experiment in Europe and Overseas, 1987-1997.
PUB DATE	1998-00-00
NOTE	6p.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Degrees (Academic); *Engineering Education; Foreign Countries; Higher Education
IDENTIFIERS	Austria; Belgium; Canada; Denmark; Finland; France; Germany; Greece; Italy; Japan; Netherlands; Norway; Portugal; Russia; Spain; Sweden; United Kingdom; United States

ABSTRACT

Ecole Centrale Paris has developed two different types of double degree programs since 1987. The Top Industrial Managers for Europe Program (TIME) allows French and foreign students to obtain two engineering degrees, each for a nominal study period of 5-6 years after high school graduation. Thirty-one technical universities in 14 European countries belong to the TIME network. Another double degree program works with industrialized countries whose educational system is based on the North American organization; that is, with an intermediate degree, the Bachelor's degree, before the Master's degree. There are 25 Technical Universities in four countries in this program. After some general information on these two double degree engineering programs, some figures are discussed regarding the origin of students while presenting some advantages of this new way of international engineering studies. The impact of these two programs on industrial recruitment will be seen through the kinds of jobs, the location of jobs, and the types of companies they effect. Some comments are included on this 10-year experience and on projects for the future. (SAH)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 453 054

An Example of Strategy for International Partnership in engineering education Through two Different Double Degree Programs : Ten years of Experiment in Europe and Overseas : 1987 - 1997

Prof. Dominique DEPEYRE, Adviser for International Relations,
and Prof. Daniel GRIMM, Deputy Director,
at Ecole Centrale Paris - F-92295-Chatenay-Malabry Cedex, France
E-mail : ddepeyre@ecp.fr

Abstract: *Ecole Centrale Paris is developing since 1987 two different types of double degree programs.*

First, the TIME ("Top Industrial Managers for Europe") program, which allows French and foreign students to obtain two engineering degrees, each for a nominal study period of 5 to 6 years after high school graduation, with no intermediate degree. 31 Technical Universities of 14 European countries are now belonging to the TIME Network (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Russia).

Another double degree program works with industrialized countries whose educational system is based on the North American organization, that is with an intermediate degree, the Bachelor's degree, before the Master's degree. We have 25 Technical Universities in 4 countries, (Canada, Japan, United Kingdom, United States), in this program.

After some general information on these two double degree engineering programs, some figures will be discussed versus the origin of students, while giving some advantages of this new way of international engineering studies. The impact of these two programs on the industrial recruitment will be focused through the kinds of jobs, the location of jobs and the types of companies.

A proposal will be developed with countries from Latin-American region (such as Brazil) or from Asia-Pacific region (as China or Indonesia).

As a conclusion, some comments have to be made on this ten-year experience and on our projects for the future.

Keywords: Engineering Education - Double Degree Program - Top Industrial Managers

Introduction

Ecole Centrale Paris, a School of Engineering created on 1829 at the service of industry, is developing since 1987 two different types of Double Degree programs in Engineering :

- the TIME Double Degree Program (for Institutions of the Continental Europe),
- the Master's Degree Program (for Institutions with an intermmediate degree : B.Sc).

It may be interesting to focus on ten years of experiment in Europe and Overseas from 1987 to 1987.

TIME Double Degree Engineering Program

Introduction on the TIME Network

European Institutions of higher education dedicated to the training of engineers have developed syllabuses enabling selected students to obtain the engineering qualifications awarded by Institutions in two different countries on the condition that students prolong the duration of study for a maximum of one year while complying with the statutory regulations for the conferral of such awards. The training courses for engineers referred to here are those which correspond to the course of the longest duration when there are several such courses available in a given country.

The TIME (Top Industrial Managers for Europe) network was founded on 1987 by 16 European Institutions under the proposal of Ecole Centrale Paris.

A **charter** was signed on October 13th, 1989. Let us recall a part of this charter :

The signatories to this document declare themselves associated for the purpose of furthering high level educational programmes for engineers and industrial executives, preparing them to function accross national borders in the European Communinity and in the world. A dual cultural background is believed to be an indispensable component of an effective and complete scientific and technical training.

These aims are to be accomplished through the development of exchanges among highly rated national engineering schools and universities, possibly leading to dual diplomas recognized equally in the participating countries.

Each signatory institution will designate a representative to a coordinating committee which will be denoted as TIME (Top dustrial Managers for Europe). TIME will be the means for internal communication between its members and represent the association in matters involving other national or international organizations.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

D Depeyre

SE 043 394
BEST COPY AVAILABLE

This **TIME Network** has since expanded to include new members. 31 Technical Universities from Europe is now belonging to the TIME Network (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Russia). These Institutions agree for developing a double degree program, the TIME ("Top Industrial Managers for Europe") program, which allows european students to obtain two engineering degrees for study covering a period of no more than 6 years after high school graduation.

Foundation of the TIME Association

During ten years, this TIME network has operated successfully. On May 15th, 1997, it was proposed to give a **formal recognition** to its existence by the creation of an Association.

There are several reasons for this, namely :

- to ensure the continued existence of the network and to extend it beyond those initially involved,
- to ensure recognition of its reality,
- to ensure that its activities become better known both internally and externally,
- to set up and jointly adopt the same methods of management, information and advertising.

Ecole Centrale Paris has ensured the organization and follow up of the activities of the network from its creation, and will continue to handle the co-ordination between institutions for the departure of the TIME Association.

On the campus of Ecole Centrale Paris (at Chatenay-Malabry, south Paris), Prof. Daniel GOURISSE, Director of Ecole Centrale Paris, welcomed the Rectors, the Presidents, the Directors of the Institutions belonging to the TIME Network.

A **Constitutive General Assembly** was held. The statutes of the TIME Association were defined and adopted unanimously. Internal regulations were adopted unanimously.

A first **Advisory Committee** of the TIME Association with ten Institutions was elected unanimously :

- for Belgium : Université Libre de Bruxelles;
- for France : Ecole Centrale Paris, Ecole Supéruere d'Electricité;
- for Germany : Technische Universität Darmstadt, Technische Universität München;
- for Italy : Politecnico di Milano, Politecnico di Torino;
- for Spain : ETSEI Barcelona, ETSII Madrid;
- for Sweden : Royal Institute of Technology Stockholm.

A **Board** was elected unanimously by the Advisory Committee :

- - President : Ecole Centrale Paris
- - Vice-President : Politecnico di Milano
- - Secretary : ETSII Madrid
- - Treasurer : Technische Universität Darmstadt.

Prof. Dominique DEPEYRE, Adviser for International Relations at Ecole Centrale Paris, was nominated as **Coordinator** of the TIME Association. An **Admissions Committee,** with 5 experts, was nominated by the Advisory Committee with as Chairman, Prof. Daniel GRIMM (Ecole Centrale Paris), and as members, Prof. Robert PONCELET (Université Libre de Bruxelles), Prof. Juan-José SCALA (ETSII Madrid), Prof. Giancarlo SPINELLI (Politecnico di Milano) and Prof. Dieter VORTMEYER (Technische Universität München).

For this Constitutive General Assembly a first **set of data** were discussed :

- 276 engineering students are involved on the year 1996-1997 through 71 bilateral agreements;
- on May 1997, more than 350 double degree engineers are already graduated in the TIME Network.

The organization of the TIME double degree engineering program

On the example of Ecole Centrale Paris, it is possible to understand the double degree engineering TIME program :

- for a student coming from ECP :
  - 2 years in Preparatory Classes before the entrance at ECP,
  - 2 years at ECP with a two-year « generalist » common core,
  - 2 years in an host Institution with a specialization;
- for a student coming from Germany or Italy or Spain :
  - 2 years in a technical University in relation with a specific department,
  - 2 years at ECP with a two-year « generalist » common core,
  - 2 years in the first technical University with a specialization.

A **selection of students** is organized every two years in this scheme.

For these both ways, a student can obtain two engineering degrees in a delay of 6 years (1 year more than for 1 degree) from two high-level European Technical Universities.

In order to assure the best adaptation of this program to the needs of industry and to provide the necessary financial support (scholarships) for these exchanges, the program is running at ECP in partnership with several large companies, which make up the Club TIME-Plus of ECP.

Master's Double Degree Engineering Program

Another Double Degree Program works on the basis of cooperation with the industrialized countries whose educational system is Anglo-Saxon in nature (Canada, United Kingdom, Japan, United States).

In the framework of bilateral agreements, students may attend graduate school in place of their final year of studies (thus obtaining a Master of Science or a Master of Engineering degree along with their degree from ECP),

while students from these partner Universities obtain a « Mastère Specialisé » degree from ECP.

Some features on the TIME Double Degree Program

At the occasion of the 10th birthday of the TIME Network an important work was made about **figures and statistics**. Allow us to show some of these figures.

On table 1. is listed the name of the 29 European Institutions which were founders of the TIME Association on May 15th, 1997.

Two new members are elected by the Advisory Committee on its meeting of February 27th, 1998 :

- Chalmers University of Technology - Goteborg (Sweden),
- Bauman Moscow State Technical University - Moscow (Russia).

Now the TIME program is running with 31 European Technical Universities coming from 14 countries.

On Table 2. is listed the number of student exchanges for the TIME double degree program for the year 1996-1997. Two main figures are given : figures through TIME Institutions and figures through countries with TIME Institutions.

On table 3. it is possible to see the **success story** of the TIME double degree engineering experience starting on 1987 with the number of double degree engineers graduated by the TIME program on May 1997.

When we are looking at the first job obtained by these double degree TIME engineers, it is possible to realize that :

- 63 % of engineers obtained their job in a company of the sending Institution country,
- 22 % of engineers obtained their job in a company of the host Institution country,
- 15 % of engineers obtained their job in a company of a third country.

While discussing with industrial recruitment staffs, we understood that this bi-cultural engineering program (2 years abroad) of our TIME engineers is considered as equivalent to a first professional experience versus motivation, flexibility and dynamics of young engineers. These new engineers are for us the future **Top Industrial Managers for Europe**.

Some features on the Master's Degree Program of ECP

At the occasion of the 10th birthday of the Master's Degree program Network an important work was made about **figures and statistics**. Allow us to show some of these figures.

On table 4. is listed the name of the 28 non-continental European Institutions which have signed an agreement with ECP for this program before May 1998.

On table 5. it is possible to see the **success story** of the Master's Degree Engineering experience with ECP starting on 1987 with the number of double degree engineers graduated by this program on May 1998.

When we are looking at the first job obtained by these double degree Master's program engineers, it is possible to realize that :

- 65 % of engineers obtained their job in a company of the sending Institution country,
- 16 % of engineers obtained their job in a company of the host Institution country,
- 19 % of engineers obtained their job in a company of a third country.

While discussing with industrial recruitment staffs, we understood that this bi-cultural engineering program (from 1 year and half to 2 years abroad) of our engineers is considered as equivalent to a first professional experience versus motivation, flexibility and dynamics of young engineers. These new engineers are for us the future **Top Industrial Managers for Europe and for Overseas**.

A proposal for the future

Now we are discussing to enlarge these two Double Degree Engineering programs to Institutions of other countries.

Two directions are defined for this future :

- Latin-American region, with countries such as Brazil,
- Asia-Pacific region, with countries such as China or Indonesia.

We are ready to discuss with Institutions of these countries for defining on a bilateral way the possibilities of exchanging engineering students, which are with a high academic level and with a high level of motivation for a bi-cultural education in engineering.

Conclusion

Our both TIME and Master's programs are now **operational tools** with more than ten years of expertise, with an increasing number of candidates coming from 18 European and Overseas countries and with an excellent image for industrial recruitment staffs.

We should like to thank all these students (more than 800 during 10 years) for their experimentation with the TIME Network and the Master's Degree ECP Network, for their clever comments about the pedagogical and technical organization, for their enthusiasm and their efficiency.

These students are for us the best ambassadors for the future.

Table 1. : List of European Institutions belonging to the TIME Network (May 1997)

Austria :	
	TU Wien
Belgium :	
	Faculté Polytechnique de Mons
	Université Catholique de Louvain
	Université de Liège
	Université Libre de Bruxelles
Denmark :	
	DTU Lyngby
Finland :	
	HUT Helsinki
France :	
	Ecole Centrale Lille
	Ecole Centrale Lyon
	Ecole Centrale Nantes
	Ecole Centrale Paris
	ENSTA
	Supaero
	Supelec
Germany :	
	RWTH Aachen
	TU Darmstadt
	TU München
	Universität Erlangen-Nürnberg
	Universität Stuttgart
Greece :	
	NTUA Athens
Italy :	
	Politecnico di Milano
	Politecnico di Torino
Netherlands :	
	TU Eindhoven
Norway :	
	NTNU Trondheim
Portugal :	
	IST Lisboa
Spain :	
	ETSEI Barcelona
	ETSII Madrid
	ICAI Madrid
Sweden :	
	KTH Stockholm

Table 2. : Student exchanges (1996-1997) for the TIME double degree program

through TIME Institutions :		through Countries :	
F : Centrale Paris	138	France	247
I : Politecnico Milano	59	Germany	94
E : ETSII Madrid	44	Spain	77
F : Supelec	39	Italy	73
D : TU München	34	Sweden	27
F : Centrale Lyon	31	Belgium	20
S : KTH Stockholm	27	.....	
D : TU Darmstadt	24		
D : Universität Stuttgart	23		
E : ETSEI Barcelona	22		
F : ENSTA	15		
I : Politecnico Torino	14		
B : FP Mons	13		
D : RWTH Aachen	12		
F : Centrale Lille	12		
.....			

Table 3. : Number of TIME double degree engineers (May 1997)

F : Centrale Paris	199
I : Politecnico Milano	131
E : ETSII Madrid	105
D : TU Darmstadt	56
D : RWTH Aachen	33
D : TU München	28
E : ETSEI Barcelona	27
D : Universität Stuttgart	26
F : Centrale Lyon	20
I : Politecnico Torino	17
S : KTH Stockholm	16
F : ENSTA	15
B : UL Bruxelles	10
E : ICAI Madrid	10
F : Supelec	10
.....	

Table 4. :List of Institutions belonging to the Master's Degree Program (July 1997)

Canada :	
	Ecole Polytechnique de Montreal
	McGill University
	Toronto University
Japan :	
	University of Tokyo
	Yokohama National University
United Kingdom :	
	Cranfield University
	Imperial College of London
	London School of Economics
	University College of London
	University of Cambridge
	University of Essex
	University of Oxford
United States :	
	California Institute of Technology
	Columbia University
	Cornell University
	Florida State Atlantic University
	Georgia Institute of Technology
	Harvard University
	Massachusetts Institute of Technology
	Stanford University
	University of California at Berkeley
	University of California at Davis
	University of California at Los Angeles
	University of Colorado
	University of Houston
	University of Michigan
	University of Minnesota
	University of Wisconsin

Table 5. : Number of Master's degree engineers with ECP (May 1998) : more than 130

through Countries :	
United States	62
United Kingdom	53
Japan	17
Canada	2
through Institutions :	
GB - Cambridge	40
USA - Cornell	16
Japan - Tokyo	14
USA - MIT	12
GB - London SE	7
USA - Berkeley	6
USA - Florida	6
.....	